

A NEW SUBSPECIES OF *LOXOCARYA STRIATA* (RESTIONACEAE) FROM THE WHICHER RANGE

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ABSTRACT

Loxocarya striata subspecies *implexa* Keighery is described and illustrated. This newly described taxon is the fifteenth endemic of the ironstone soils at the base of the Whicher Range, south-east of Busselton.

INTRODUCTION

Over the past decade the Western Australian Department of Environment and Conservation (previously the Department of Conservation and Land Management) has undertaken intensive floristic and reserve surveys of the Swan Coastal Plain (Gibson *et al.* 1994, Keighery 1999). Currently these surveys are continuing under a new program entitled "Swan Bioplan" and have been extended to include the Darling and Whicher Escarpments of their respective ranges.

During these surveys a very distinctive vegetation community was described (Gibson *et al.* 1994) from shallow red clay soils over ironstones south-east of Busselton at the base and foothills of the Whicher Range. This community comprised tall

shrublands of *Dryandra squarrosa* subsp. *argillacea*, *Calothamnus* sp. (Whicher) and *Hakea oldfieldii* over open to dense low shrublands over tall sedges over dense herbs.

This and subsequent surveys have also uncovered a series of localised endemic plants on these soils, namely: *Andersonia ferricola* ms, *Calytrix* sp. Tutunup (G. Keighery et N. Gibson 2953), *Brachyscias* *verrucundus*, *Chamelaucium roycei* ms, *Darwinia* sp. Williamson (G. Keighery 12717), *Dryandra squarrosa* subsp. *argillacea*, *Dryandra nivea* subsp. *uliginosa*, *Gastrolobium modestum*, *Gastrolobium papilio*, *Grevillea elongata*, *Grevillea maccutcheonii*, *Hakea oldfieldii*, *Petrophile latericola* ms and *Stylidium ferricola*. The community and many of the constituent taxa are listed as endangered or rare

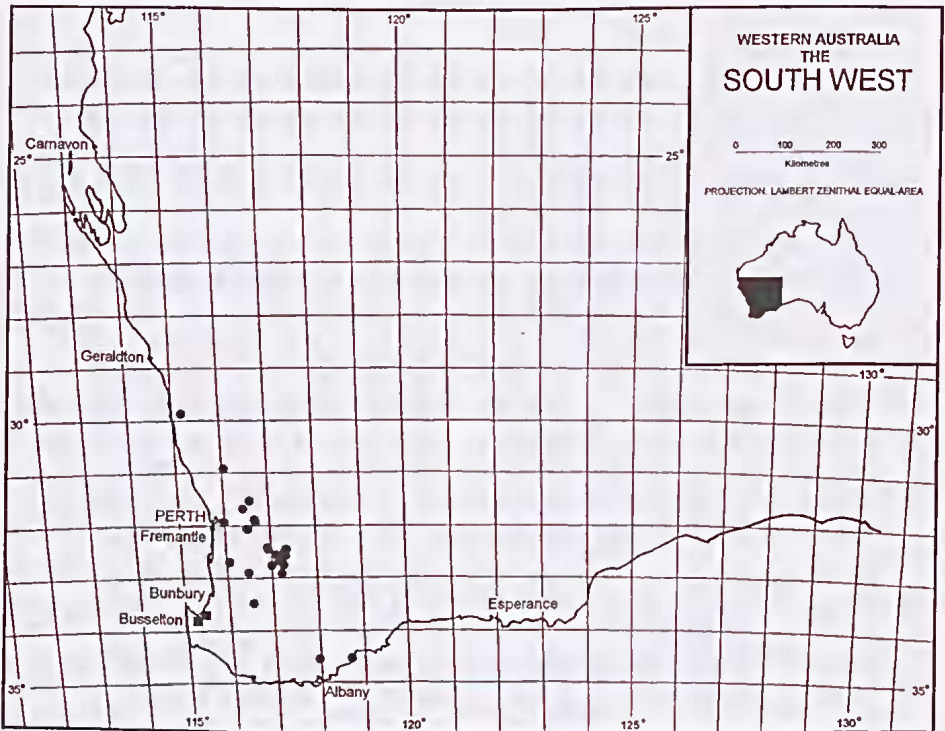
under State and Federal acts. This paper describes another localized endemic of this habitat.

One taxa uncovered during these surveys was an unusual member of the genus *Loxocarya*. The *Loxocarya* populations found on the Ironstones were referable to *L. striata*, which was previously a member of the genus *Megalotheca*, but has been placed in a re-circumscribed *Loxocarya* (Briggs and Johnson 2001a & b).

The ironstone populations differ in being smaller in floral and vegetative measurements (Meney

et al. 1999). Both taxa occur on skeletal soils over laterite or ironstone and both are apparently obligate seeders. The habitat of *Loxocarya striata* subsp. *implexa* is markedly different in often being waterlogged in spring. These populations are also allopatric to the main range of the species (Map 1). This combination of morphological and habitat characters are considered worthy of recognition at a subspecific level.

This paper forms part of a continuing series (Keighery 1997, 1998, 2001a&b) documenting the



Map 1. Distribution of *Loxocarya striata* showing *Loxocarya striata* (F. Muell.) B.G. Briggs & L.A.S. Johnson subsp. *striata* (circles). *Loxocarya striata* subspecies *implexa* Keighery (squares).

taxonomic outcomes of the above surveys, by describing this new subspecies. It is the third paper in a series on the flora and vegetation of the Whicher Range (Keighery *et al.* 2008, Keighery 2008).

TAXONOMY

Key to *Loxocarya* (From Pate and Meney 1999)

1. Fruit heart shaped (bilocular), styles 2 2
1. Fruit unifolocular, style 1
..... *L. magna*
2. Tufted plants, densely packed culms on erect or shortly creeping rhizomes 3
2. Clonal plants, widely spaced culms on stout spreading rhizomes *L. cinerea*
3. Culms 2 mm or less in diameter at base, less than 1 metre tall, female spikelets 2-many per culm, 7–10 mm long 4
3. Culms 3–4 mm in diameter at base, 2 metres tall, female spikelets 1–3 per culm, 30–50 mm long *L. gigas*
4. Culms 0.8–1 mm diameter at base, twisted and freely branched throughout 5
4. Culms 1–2 mm diameter, straight or sparingly branched at top *L. albipes*
5. Plants forming large clumps to 1 metre tall from creeping rhizome, 3–4 mm diameter
..... *L. striata* subsp. *striata*
5. Plants forming compact dense

clumps to 40 cm tall from short rhizome, c. 2 mm diameter
..... *L. striata* subsp. *implexa*

Description of species

Loxocarya striata (F. Muell.) Briggs et Johnson subsp. *implexa* G.J. Keighery subsp. nov. (Figure 1 and 2)

Inter species *Loxocarya striata* stature minore distinguitur, rhizomata 2 mm diametro, culmi ad 20–40 cm longi, spicae femineae 4–5 mm longa; fructus 5–6 mm longi.

Typus: Williamson Road, Whicher Range, 16 March 1991, G.J. Keighery 12060,a (holo: PERTH male plant, iso: to be distributed).

Plants dioecious forming small rounded clumps of numerous erect to spreading culms from interlaced short slender rhizomes, 1–2 cm deep, to 20 cm long, 1.8–2 mm diameter, orange brown with white hairs when young. Culms, hollow, light green, 20– 40–(50) cm long, sinuose and branched throughout, striate, 1–1.2 mm diameter at base. Culm sheaths appressed, red-brown, 8–10 mm long, lamina 3–3.3 mm long. Culms bearing numerous elongate spikelets, widely spaced on branched culms. Male spikelets 3–5 mm long. Female spikelets few per culm, 4–5 mm long, enlarging to 5–6 mm long and 5 mm wide in fruit. Fruit a heart shaped capsule, 5–6 mm long with a prominent persistent stylar beak.



Figure 1. Male flowering culms of *Loxocarya striata* subsp. *implexa*. Voucher G. Keighery 12060a (PERTH). Scale bar =1 cm.

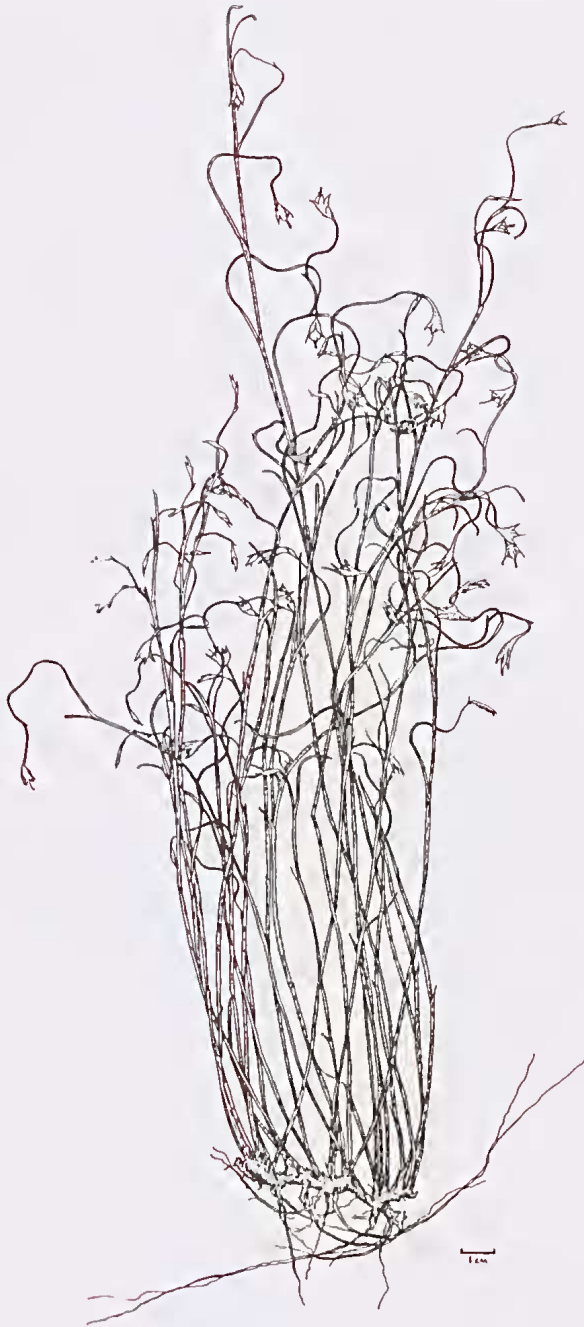


Figure 2. Female flowering culms of *Loxocarya striata* subsp. *implexa*. Voucher G. Keighery 12060b (PERTH). Scale bar = 1 cm.

Other specimens examined. WESTERN AUSTRALIA: Treeton, FV 2089, 33° 47' S 115° 17' E, 7 Nov. 1983, G.S. McCutcheon 1044 (PERTH); Williamson Road, Whicher Range, 33° 42' S 115° 38' E, 16 March 1991, G.J. Keighery 12060,b (female PERTH);

Distribution. Foothills of the Whicher Range south-east of Busselton (Map 1). On the interface between the Swan Coastal Plain IBRA region and the Jarrah Forest (Thackway and Creswell 1995).

Habitat. Recorded as occurring on shallow yellow sands and shallow red clays over massive ironstones.

Flowering Period. Flowering recorded from March to April, probably before the first winter rains. Mature fruits and seeds produced as flowering ends.

Conservation Status. The subspecies is naturally very localised but has a large population in Willcox Forest Block. Potentially endangered by mineral sand mining and hydrological change via water extraction for mining, agriculture or urban uses.

Etymology. The specific name denotes the intricately inter-branched culms.

DISCUSSION

This subspecies differs from the nominate subspecies of *L. striata* in the dimensions of almost all vegetative and floral features. Plants are much smaller and more densely compact than *L.*

striata, being up to 50 cm tall compared to 60cm to over 1 metre. Consequently the rhizome of this subspecies is 20 cm long and 2 mm wide compared to 40 cm long versus 3–4 mm wide. The culms of *L. striata* subsp. *implexa* are 20–40 cm long, compared to 60–120 cm long. Fruits are also smaller (5–6 mm long compared to 10–12 mm long).

This is the fifteenth taxon endemic to the Busselton Ironstones habitat (which themselves were only documented in the 1990's), of which ten have now been formally described.

ACKNOWLEDGEMENTS

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REFERENCES

- BRIGGS, B.G. and JOHNSON, L.A.S. 2001a. The genus *Desmocladus* (Restionaceae) and new species from the south of Western Australia and South Australia. *Telopea*, 9: 227–245.
- BRIGGS, B.G. and JOHNSON, L.A.S. 2001b. New species of *Harperia*, *Loxocarya*, *Onychosepalum*, *Platychorda* and *Tremulina* (Restionaceae) in Western Australia. *Telopea*, 9: 247–257.
- GIBSON, N., KEIGHERY, B.J., KEIGHERY, G.J., BURBIDGE, A.H. and LYONS, M.N. 1994. A Floristic Survey of the Southern Swan Coastal Plain. Report for the Australian

Heritage Commission by the Department of Conservation and Land Management and the Conservation Council of Western Australia (Inc.).

KEIGHERY, G.J. 1997. A new subspecies of *Lambertia* R. Br. (Proteaceae). *Nuytsia*, 11: 283–284.

KEIGHERY, G.J. 1998. Taxonomy of *Diplopeltis huegelii* (Sapindaceae). *Nuytsia*, 12: 289–291.

KEIGHERY, G.J. 1999. *Conservation status of the vascular flora of the southern Swan Coastal Plain*. Report for Environment Australia. Department of Conservation and Land Management, Perth.

KEIGHERY, G.J. 2001a. A new subspecies of *Isotropis cuneifolia* (Fabaceae). *Nuytsia*, 13: 471–474

KEIGHERY, G.J. 2001b. A new species of *Chamaescilla* (Anthericaceae) from Western Australia. *Nuytsia*, 13: 475–478.

KEIGHERY, G.J. 2008. A New Species of *Lomandra* (Lomandraceae) from the Whicher Range, Western Australia. *Western Australian Naturalist* 26: 16–20.

KEIGHERY, G.J., KEIGHERY, B.J. and GIBSON, N. 2008. Floristics of the Whicher Range I: Flora and Vegetation of Dardanup Forest Block. *Western Australian Naturalist* 26: 42–66.

MENEY, K.A., PATE, J.S. and HICKMAN, E.J. 1999. Morphological and anatomical descriptions of Restionaceae and allied families and their distribution. Pp. 160–460. In: *Australian Rushes*. Meney K.A. & J.S. Pate (eds), University of Western Australia Press, Nedlands.

PATE, J.S. and MENEY, K.A. 1999. Field keys for identification of Australian species of Restionaceae, Anarthriaceae and Ecdociaceae. Pp. 129–159. In: *Australian Rushes*. Meney K.A. & J.S. Pate (eds), University of Western Australia Press, Nedlands.

THACKWAY, R. and CRESWELL, I.D. 1995. *An interim biogeographic regionalisation for Australia*, version 4. (Australian Nature Conservation Agency: Canberra).